

Minimum Temperatures.—The minimum temperatures have been for northern stations. Yankton, -18° ; St. Paul, -22° ; Pike's Peak, -17° ; Pembina, -48° ; Omaha, -19° ; Alpena, -11° ; Burlington, Vt., -12° ; Breckenridge, -28° ; Duluth, -28° ; Eastport, -20° ; Escanaba, -12° ; Fort Sully, -28° ; Marquette, -16° ; Milwaukee, -10° ; North Platte, -14° ; Malone, -16° ; Mount Washington, -42° , and for southern stations, Galveston, 35° ; Indianola, 33° ; Jacksonville, 36° ; New Orleans, 36° ; St. Marks, 30° ; Brownsville, Texas, 42° ; Key West, 63° .

Ranges of Temperatures.—The least ranges of temperature have been: San Francisco, 26° ; Key West, 22° ; Galveston, 39° and Cape May, 22° .

Frosts destructive to vegetation and to the premature buds, are reported from Ohio, North Carolina, 24th; Virginia, 10th, and subsequently.

PRECIPITATION.

Amount of Rain and Snow.—Chart No. III shows the general distribution of precipitation for the month, and that there has been in general an excess over the Lake region, New England and Canada, as also in Louisiana, and a deficiency in the remaining Gulf States, Tennessee, Ohio valley and the South Atlantic States. Snowfall is reported from 13 to 18 inches in Conn.; 5 or 6 in Ind., Ill., Iowa and Ken.; 23 to 29 in Maine; 11 to 22 in Mass.; 2 to 10 in Minn.; 4 to 7 in Neb.; 25 to 35 in N. H.; 7 to 48 in N. Y.; $1\frac{1}{2}$ at Weldon, N. C.; 5 to 8 in Ohio; 6 to 13 in Penn.; 22 in Utah; 20 to 38 in Vt.; 2 to 4 in Va.; 10 in W. V.; 8 to 19 in Wis.

Rainy days.—The number of days on which rain or snow fell during February, averaged from 14 to 16 on the middle and east Atlantic coasts; from 16 to 20 in the Lake region; from 8 to 12 in the upper Mississippi and Ohio valleys; from 8 to 10 in the Southern States, except 16 in southern Louisiana. From 2 to 5 rainy days are reported from the plains of Kansas and Nebraska.

Cloudy days.—The number of cloudy days, (averaging eight-tenths or more of cloudiness,) for the Atlantic States, from Georgia to Maine, varied between 7 and 17, the latter number belonging to Middle Atlantic States and Long Island. From 5 to 11 cloudy days were reported from the region between the Alleghanies and the 100th meridian.

RELATIVE HUMIDITY.

The mean relative humidity for February averages as follows, (not corrected for altitude.) *Dry stations:* Santa Fé, 39; Pike's Peak, 55; Dodge City, 48; Denver, 39; Colorado Springs, 35; Cheyenne, 45. *Damp stations:* Pembina, 92 (?); Albany, 84; Cleveland, 82; Marquette, 80; Mt. Washington, 84.

WINDS.

Wind directions.—The prevailing winds are shown by the arrows upon Chart No. II, from which it will be seen that these have been decidedly northwesterly in all the northern half of the country, southerly in the Southwest, and northeast to southeast on the south Atlantic coast.

Total movements.—The sum total of the movements of the air from all directions, as given by the daily readings of anemometers, have been as follows, in miles. Large movements: Breckenridge, 10,574; Cheyenne, 11,531; Eastport, 10,110; Erie, 11,080; Grand Haven, 10,359; Indianola, 10,501; Kittyhawk, 10,052; Long Branch, 11,629; Manhattan, 10,228; Pike's Peak, 20,908; Sandy Hook, (?); Wood's Hole, 10,143; Thatcher's Island, 13,930. The record from Pike's Peak shows decidedly the largest monthly movement recorded there during the past three years. Small movements: Wytheville, 2,982; Savannah, 3,520; Salt Lake City, 2,460; Nashville, 3,588; Mobile, 3,936; Memphis, 3,561; Lynchburg, 2,832; Augusta, 2,899.

The highest winds.—The maximum winds of the month have been very severe, especially those in connection with the extensive storms of the 1st and 2d and the 15th and 16th. Among these the following are worthy of mention: On February 1st or 2d, Albany, northwest, 70 miles; Stapleton, N. Y., west, 60; Boston, southwest, 50; Barnegat, northwest, 60; Vevay, Ind., northwest, 60; Cape Henry, northwest, 52; Cape May, northwest, 56; Long Branch, northwest, 72; Springfield, Mass., northwest, 60; Lexington, Ky., south, 52; Flushing, 74; New York, northwest, 66; Thatcher's Island, northwest, 70; Newport, west, 80; Washington, northwest, 60 to 72. On other dates maximum winds of 50 miles per hour or more were experienced as follows: Dodge City, 29th, west, 50 miles; Duluth, 26th, northeast, 52; Cape Hatteras, 14th, southwest, 56; Kittyhawk, 22d, north, 60; Mt. Washington, 24th, northwest, 168; Malone, 12th, west, 60; Pike's Peak, 1st, southwest, 72; Port Huron, 19th, south, 50; Sandy Hook, 15th, northwest, 80. As an interesting instance of the power of a strong wind to produce eddies, in which very low pressure exists, it is reported that, on the early morning of the 2d, in Washington, a gust of at least 70 miles velocity, in rushing past an exposed dwelling in the higher part of the city, caused the windows of a small room on the leeward side of the house to burst outwards, a result evidently due simply to the expansion of the confined air, as the room doors were closed, and there was no fire-place or other way of escape.

Local Storms.—Storms of the nature of tornadoes or destructive gusts of wind were reported on the 13th near Friendsville, Ill.; 14th, at Buffalo, N. Y.; 27th, St. Charles, Mo., Princeton and St. Meinrad, Ind.

WATER TEMPERATURES.

The monthly maximum and minimum temperatures of the water in rivers and harbors, are given in a table on Chart No. II. Minima of 30° or 32° , were reported from Cleveland, Detroit, Duluth, Grand

Haven, Keokuk, Leavenworth, Milwaukee. New York, Portland, Me., Toledo and Wood's Hole. The maximum temperatures were: Galveston, 69; Jacksonville, 66; Key West, 78; St. Marks, 68. The range has been least at San Francisco, 5°; Baltimore, 4°; Buffalo, 4°; Detroit, 1°; Eastport, 2°; Grand Haven, 1°; Louisville, 5°; Milwaukee, 1°; Mobile, 5°; New London, 3°; New York, 2°; Portland, Me., 3°; Wood's Hole, 4°.

NAVIGATION.

Depth of water in rivers.—A table on Chart No. III gives the highest and lowest readings of the river gauges during the month, from which it will be seen that the Red river was, on the 29th, 8 feet lower than on the 10th. The Ohio was from 12 to 30 feet below its position in the early part of the month. The upper and lower Mississippi had risen slightly and the central Mississippi fallen somewhat at Cairo, after the 4th, and at Vicksburg after the 25th to 29th. The flood that had come down the Ohio, however, left the water near the "danger line," during a number of days, causing some inconvenience.

Ice in rivers and harbors.—The reports of ice in the harbors and rivers, are as follows: Fort Niagara. N. Y., floating ice in river, 2d, 17th, 20th, 23d; Columbia, S. C., ice formed on the 2d; Middletown, Conn., the river ice moving on the 14th, river open 17th, closed 23d; Rockford, Ill., river clear 12th, 22d, 26th, frozen over 16th and 20th; Havana, Ill., the Illinois river not closed during the month; Muscatine, Iowa, river gorged the 3d, moved on the 9th, clear on the 10th; Point Pleasant, La., ice formed on the 2d and 5th; New Orleans, ice, 2d; Fall River, Mass., Mount Hope bay frozen over on the 25th; Traverse City, Mich., Grand Traverse bay frozen, 22d; Kensico, N. Y., on the 28th, pond ice, 6 inches thick; Starkey, N. Y., ice in Seneca Lake, 25th; Trenton, N. J., the Delaware closed, 4th, opened, 7th; Tioga, Penn., river clear on 15th, frozen on 23d; Penville, Penn., ice moving out, 10th; North Shippen, Penn., pond ice, 5 inches thick, on 6th; West Charlotte, Vt., Lake Champlain partly frozen, 3d, completely frozen and crossed by skaters, on the 4th and crossed by horsemen on the 12th; Bloomfield, Wis., Geneva Lake, ice 12½ inches thick; Grand Haven, Mich., ice blockade, 4th; Salt Lake City, Utah, railroad trains snow-bound, 1st; Philadelphia, Penn., in the Schuylkill river, 5 inches of ice, 6th, Delaware river, floating ice, 8th and 9th; Albany, ice gorge, 16th, Toledo river frozen 3d and 23d, cleared 10th; Buffalo, N. Y., in the Erie canal basin, 8 inches of ice, 7th; Erie, Penn., 5 inches of ice on the 4th; Montgomery, Ala., ice on the 2d; Detroit, Mich., ice in the river on the 14th and 24th; Davenport, Iowa, floating ice on the 1st, 9th and 10th, ice gorge 2d, river frozen over, 3d, ice moving on 5th, ferry-boat running, 11th; Leavenworth, Kan., river frozen over on the 4th, clear, 9th; Pittsburgh, Penn., floating ice, 5th; Keokuk, Iowa, much floating ice on the 4th, clear, 6th; Omaha, Neb., river frozen during the whole month; Duluth, Minn., Lake Superior frozen during the month.

VERIFICATIONS.

(1) *Verifications.*—The comparison of the published Probabilities with the weather following gives an average percentage of verifications, for February, for the whole region east of the Rocky Mountains, 89.8 per cent.

(2) *Cautionary Signals.*—Of 141 Cautionary Signals displayed during February at the United States stations, 110 were justified and thirty one not justified by velocities of 25 miles at or near the stations; 63 cases are reported for which signals were not previously ordered.

ATMOSPHERIC ELECTRICITY.

(1) *Auroras.*—The principal aurora of the month was that of the evening of the 19th and early morning of the 20th, of which reports have already been received from 122 stations, representing the entire country from Kansas and Montana eastward to the Atlantic. The other displays were observed during the month as follows: 5th, Woodstock, Vt.; 11th, Dodge City, Kan.; 16th, Breckenridge and Duluth, Minn., Rocky Run, Wis.; 17th, Marquette, Alpena, Grand Haven, Mich., Eastport, Me., Mt. Washington, N. H., Cornish and Gardiner, Me., South Minneapolis, Minn., Rocky Run and Utica, Wis.; 18th, Bangor, Me., Duluth, Minn., Fort Sully, D. T., Aston, Guttenberg and Monticello, Iowa, Gardiner, Me., South Orange, N. J., Cazenovia, N. Y., Ringgold, Ohio, Embarrass and Rocky Run, Wis.; 20th, Waltham, Mass.; 22d, Carthage, Ohio; 26th, Gardiner, Me.; 27th, Escanaba, Mich.; 29th, Frankfort, Mo.

(2) *Thunder and lightning* occurred on the 1st in Tenn. and N. M.; 3d, La. and Ala.; 4th, Ala.; 7th, Ala., Miss., Penn. and Texas; 8th, Ill., Iowa, Kan., Neb., Penn., Wis. and Cal.; 9th, Ill., Ind., N. Y., Iowa, Kan., Mich., Neb. and Ohio; 10th, Ill., Ind. Ter., Iowa, Kan., Mich., Mo., Ohio and Wis.; 11th, Mich., Ala., Ga., Ill., Ind., Iowa, Me., Md., N. Y., Ohio and Tenn.; 12th, Ga., Ohio, Va. and Ind.; 13th, Ala., Ky., Miss., Tenn., Va., Ga., Ill., Ind., Mich., La., Mo., Ohio, S. C., N. C. and Texas; 14th, Mich., R. I., S. C., Tenn., Ala., Del., Fla., Ga., La., Md., Mass., N. J., N. Y., N. C., Penn., Va. and W. Va.; 15th, N. Y., Mass., N. J. and Penn.; 16th, Del.; 20th, Kan., Ga., Iowa, Neb. and Texas; 21st, Ala., N. C., S. C. and Texas; 25th, Mich. and N. J.; 26th, Ill., Iowa, Neb. and Kan.; 27th, Ill., Mich., N. C., Ga., Ind., Iowa, Ky., Mo., Ohio, Penn., S. C. and Wis.; 28th, Del., Ind., Md., Mich., N. J., N. Y., N. C., Penn., Va., W. Va. and Wis.; 29th, Kan. and Neb.

(3) *Telegraphic ground currents* were observed at Chicago, Ill., on the 1st, during a light snow and brisk northwest winds, and at Fort Sully, D. T., on the 29th, also during light snow. Telegraphic operations were disturbed on the 1st on the Western Union line running northeast from Santa Fé to Cimarron,